ADCIRC - CH3D- ICM Modeling System

Initial Calibration April 2006

TOPO! map printed on 06/26/07 from "North Carolina.tpo" and "Currituck.tpg"
76°19'00" W
76°10'00" W
76°01'00" W
75°52'00" W
WGS84 75°36'00" W
36°46'00" N
36°39'00" N
36°32'00" N
36°25'00" N
36°18'00" N
36°11'00" N
36°04'00" N
35°57'00" N
VIRGINIA BEACH
Chesapeake
DISMAL SWAMP NATIONAL WILDLIFE REFUGE
BACK BAY N W R
MACKAY ISLAND NATIONAL WILDLIFE REFUGE
Knotts Island
Currituck
Corolla
Coinjock
Waterlily
Aydlett
Poplar Branch
Grandy
Jarvisburg
Duck
Powells Point
Camden Pt
Wade Pt
Mamie
Spot
Harbinger
Pt Harbor
Kitty Hawk
Kitty Hawk Bay
Eagleton
Kill Devil
WRIGHT BROS NAT MEMORIAL
Mashoes
FORT RALEIGH NAT HIST SITE
Manteo
Nag
Durant I
East Lake
Goat Neck
Ft Landing
River Neck
Columbia
Travis
Laurel Pt
Evil Bay
Harvey Pt
Stevenson Pt
Drummond Pt
Durants Neck
Nixonton
Weeksville
Woodville
Okisko
Elizabeth City
Camden
Indian Town
Shiloh
Riddle
Texaco Beach
Old Trap
Bertha
Belcross
Morgans Corner
Snowboro
Gregory
Barco
Maple
Snowden
South Mills
Lilly
Moyock
Northwest
Munden
Creeds
Back Bay
Pleasant Ridge
Princess Anne
Nimmo
Sigma
Pungo
Mapleton
Salemo
Millville
Deep Creek
Camden Mills
Butts
Great Bridge
Grassfield
Fentress
Hickory
Long Ridge
Saint Brides
Back Bay
Northwest R
Tull Bay
Landfill R
FERRY
Pasquotank River
Little River
Perquimans River
ALBEMARLE SOUND
ATLANTIC
PASQUOTANK
CAMDEN
CURRITUCK
PERQUIMANS
SOUTHERN
NORFOLK
INTRACOASTAL WATERWAY
4
5
6
7
14
20
21
23
24
0 5 10 15 20 25 miles
0 5 10 15 20 25 30 35 40 km
MN 11° TN
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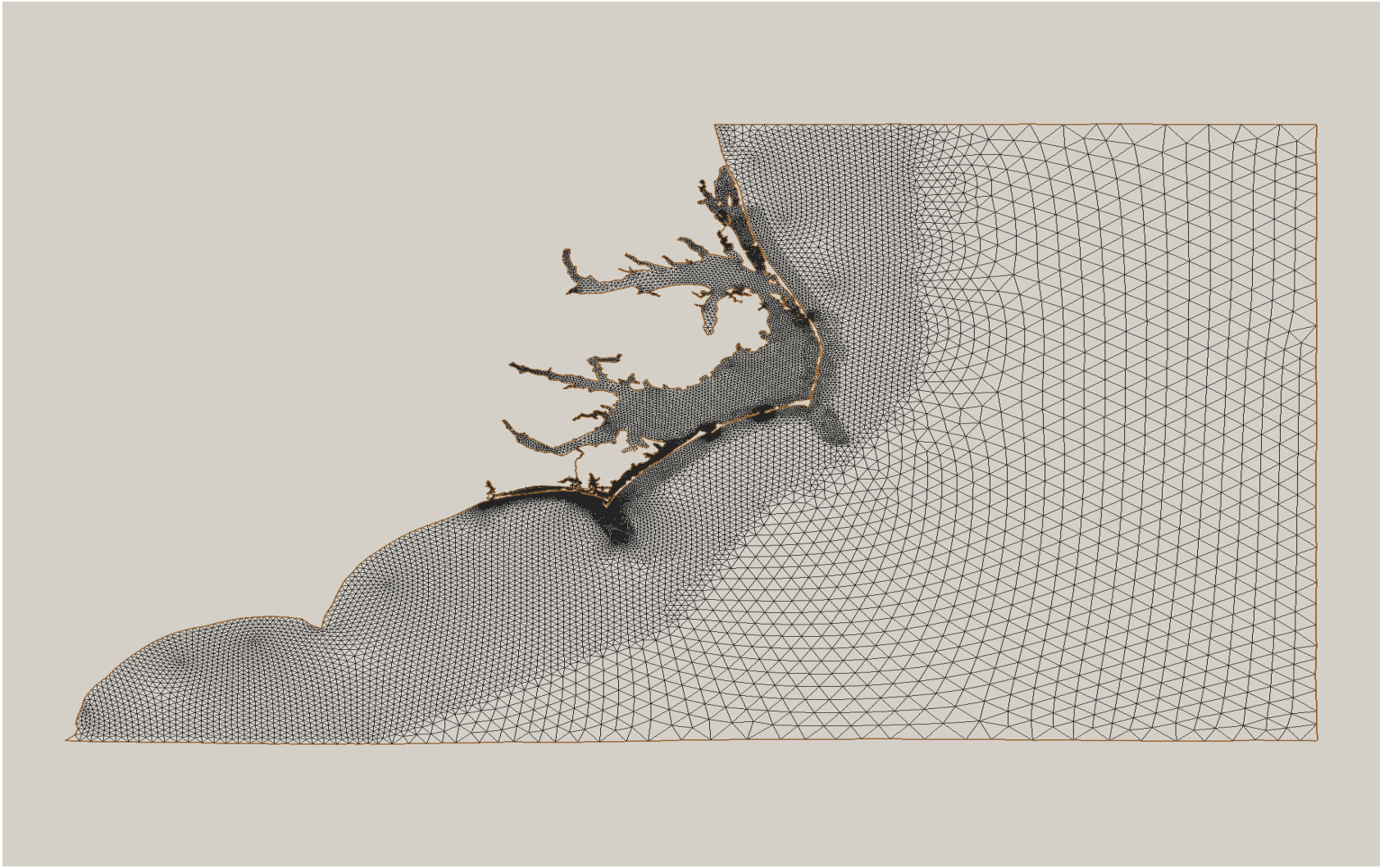
ADCIRC - CH3D- ICM Modeling System

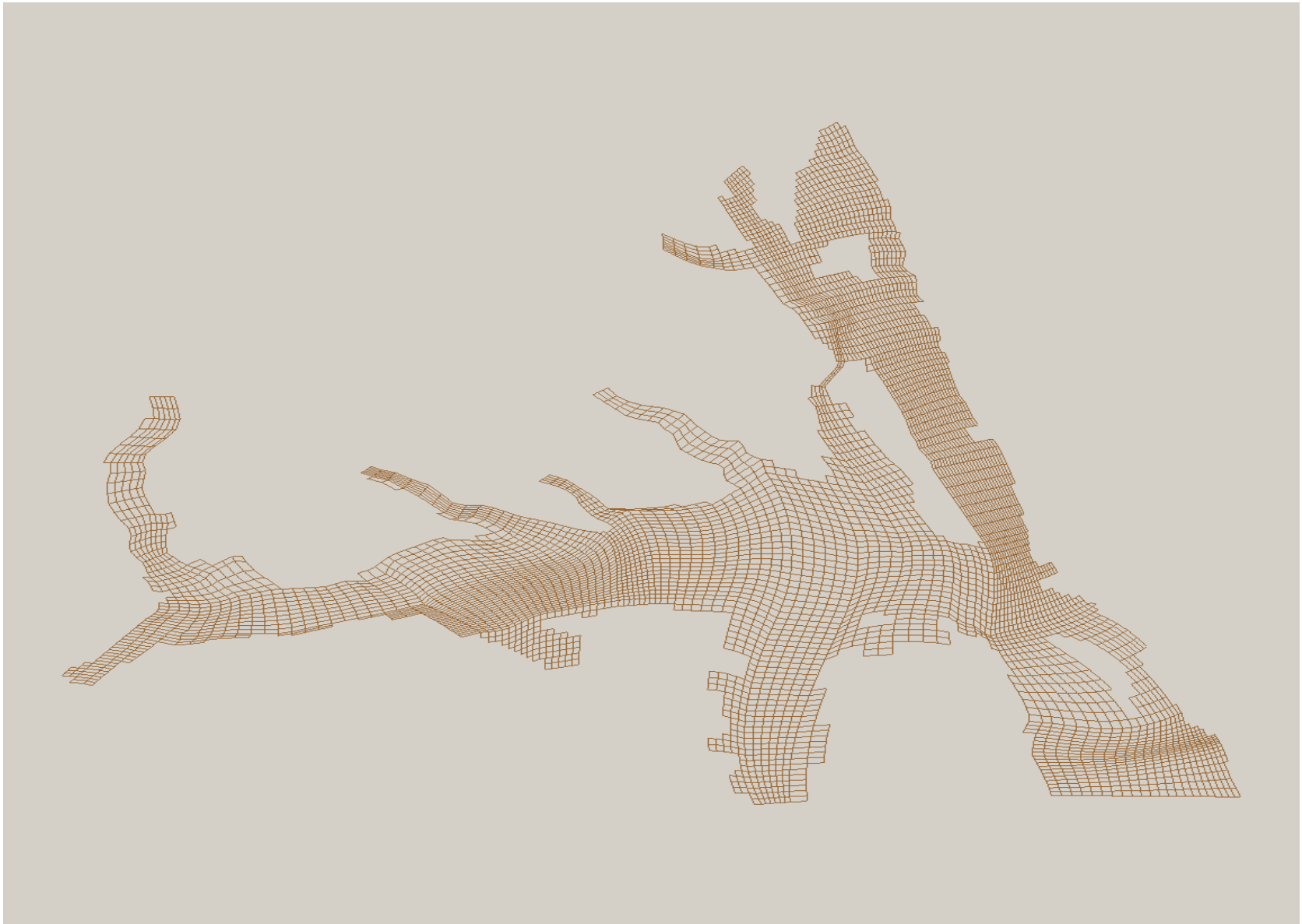
- **ADCIRC - CH3D Linkage**
- **CH3D - ICM Linkage**
- **Upgraded Bathymetry (Captain Barry Cullens)**
- **Modified Buoy Wind Algorithms**
- **ADCIRC CH3D Calibration April 2006**

Pamlico/Albemarle/Currituck Sound

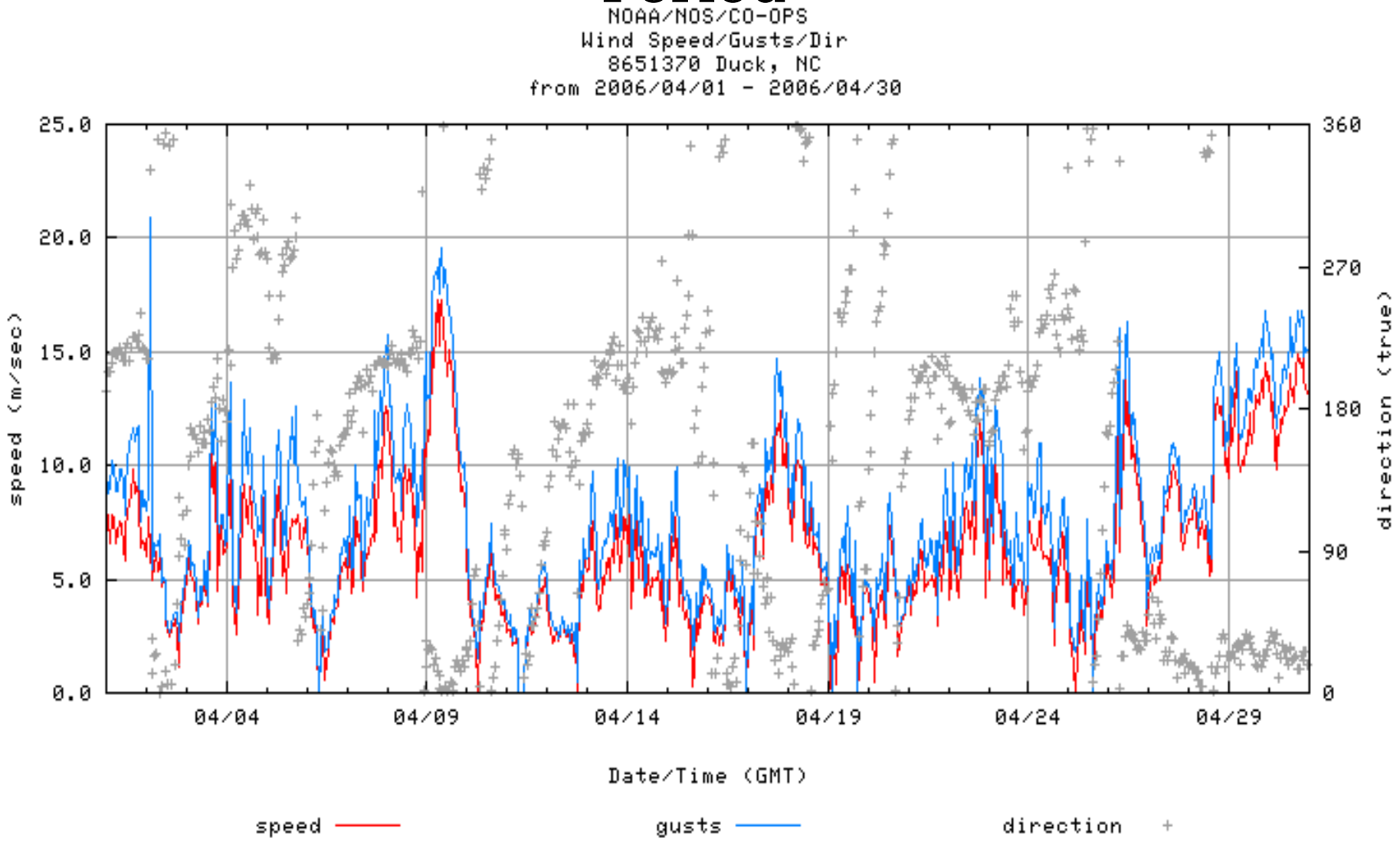
ADCIRC Grid



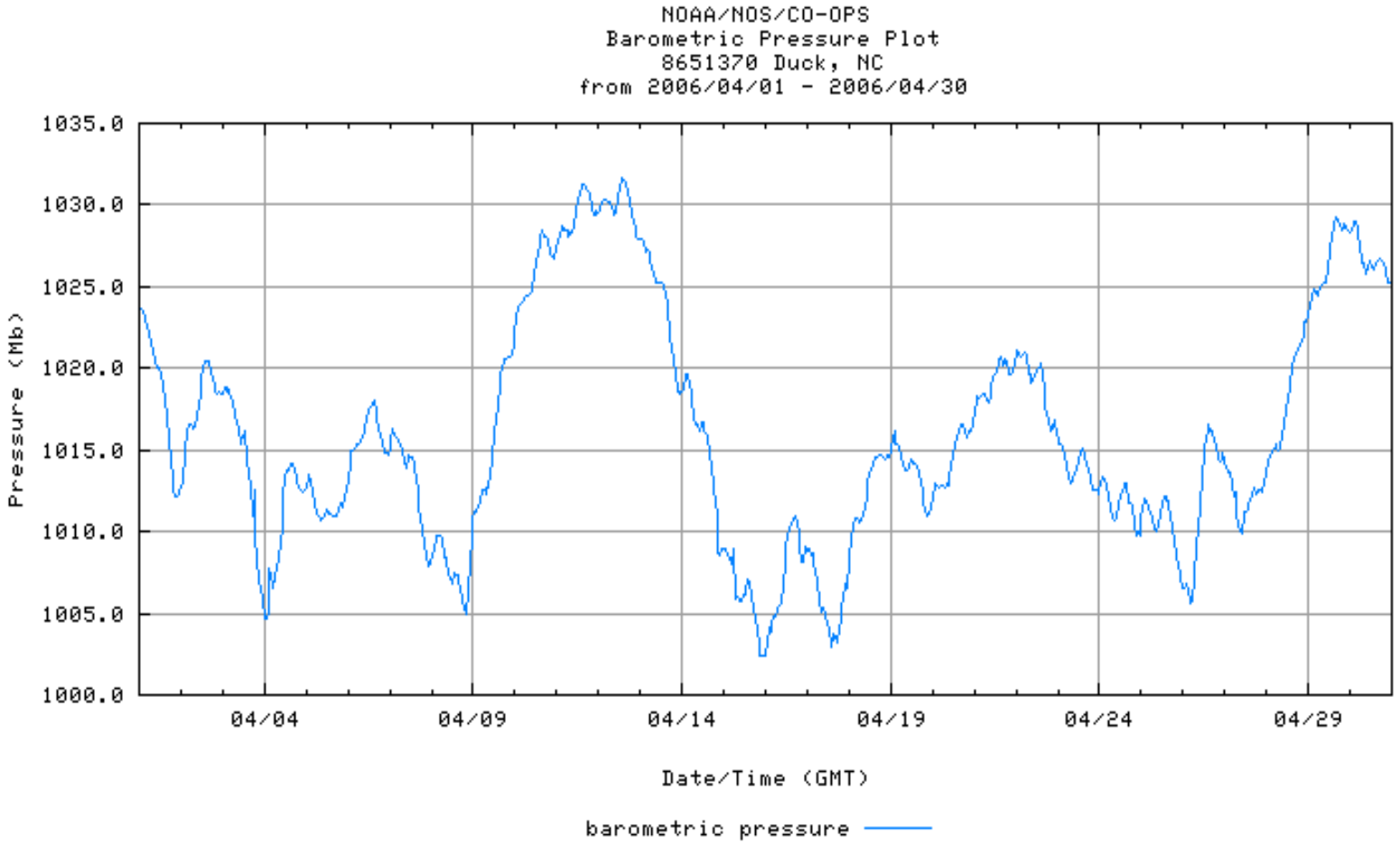
Pamlico/Albemarle/Currituck Sound CH3D-ICM Grid

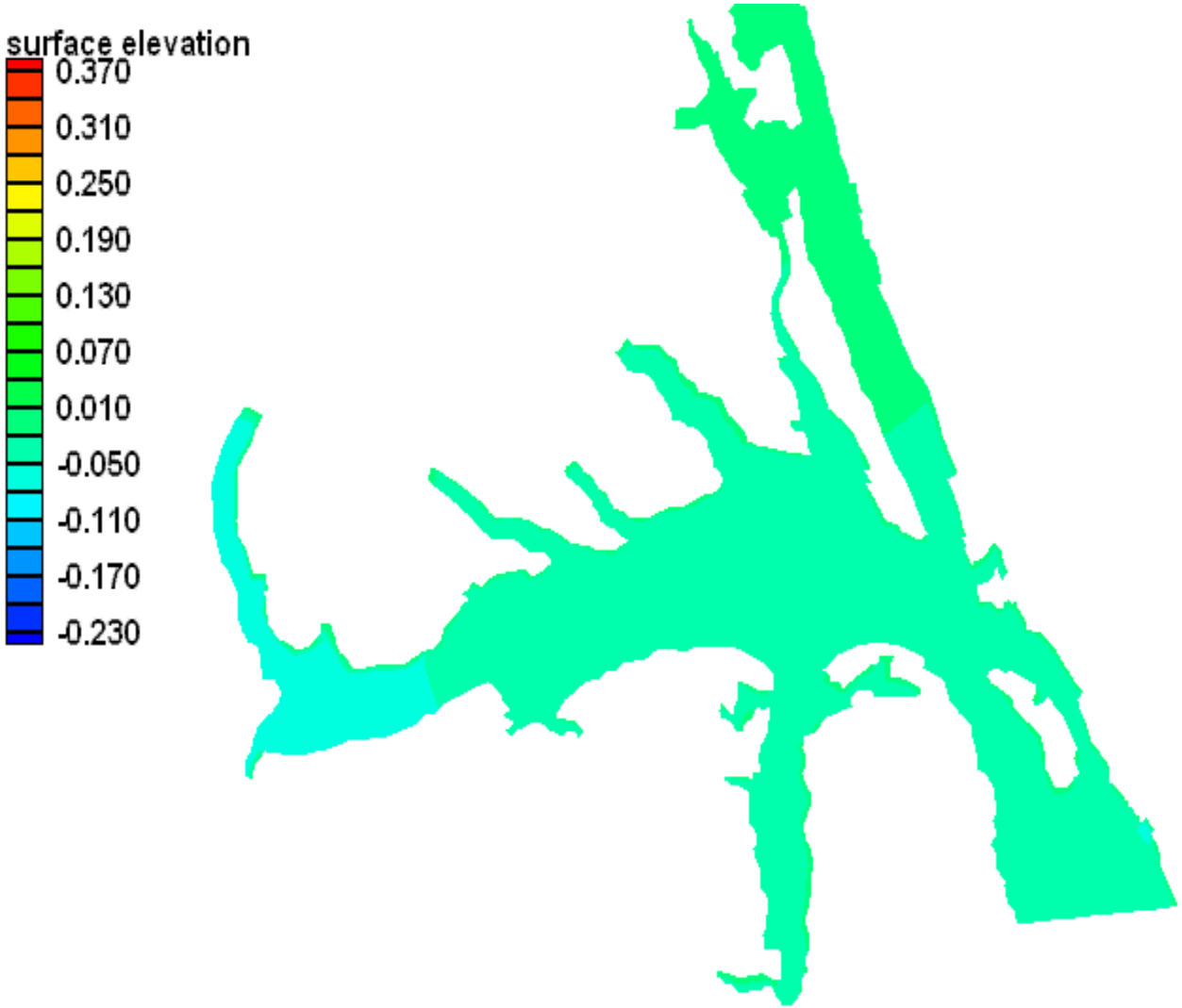


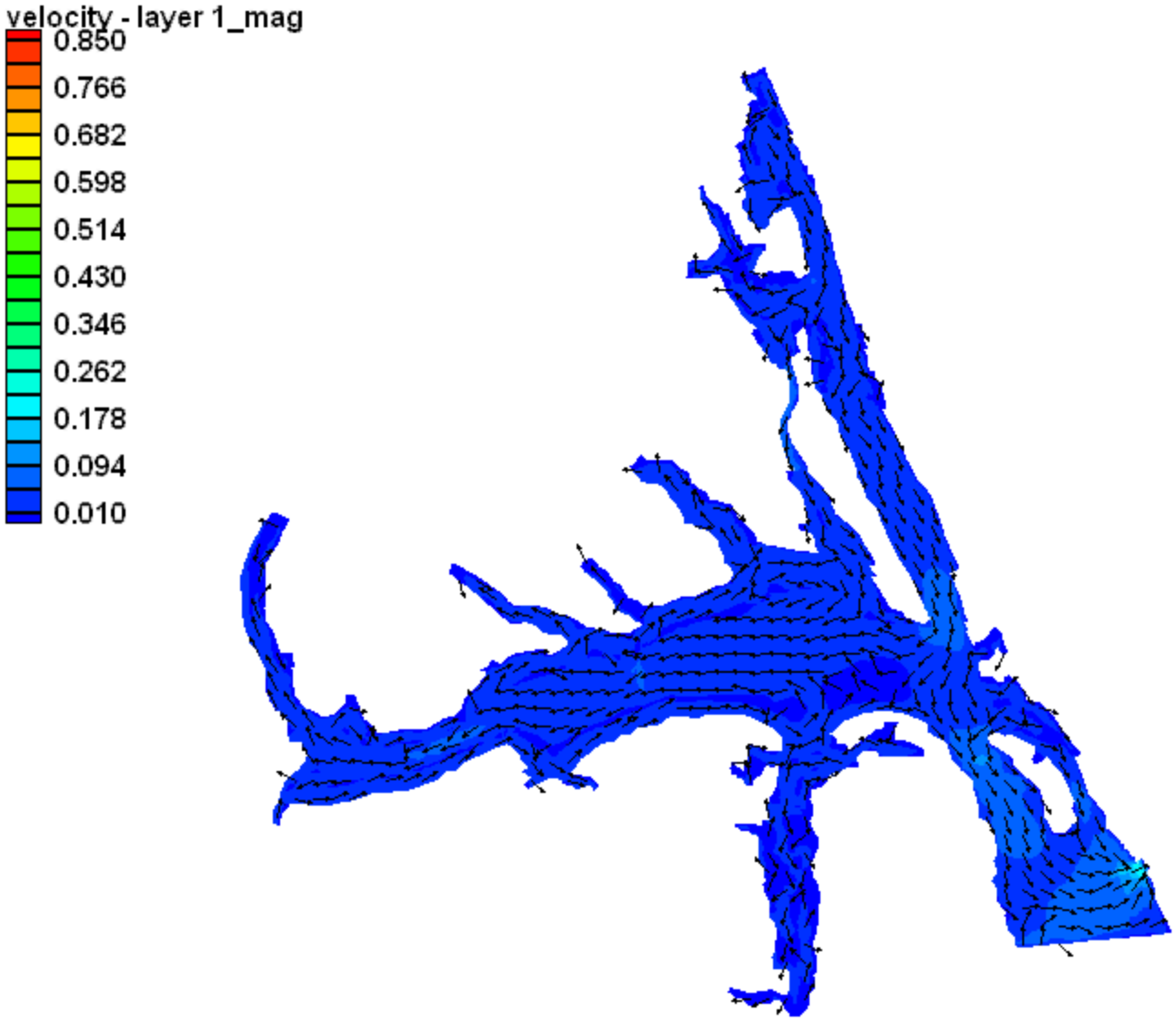
April 2006 Initial Model Calibration Period

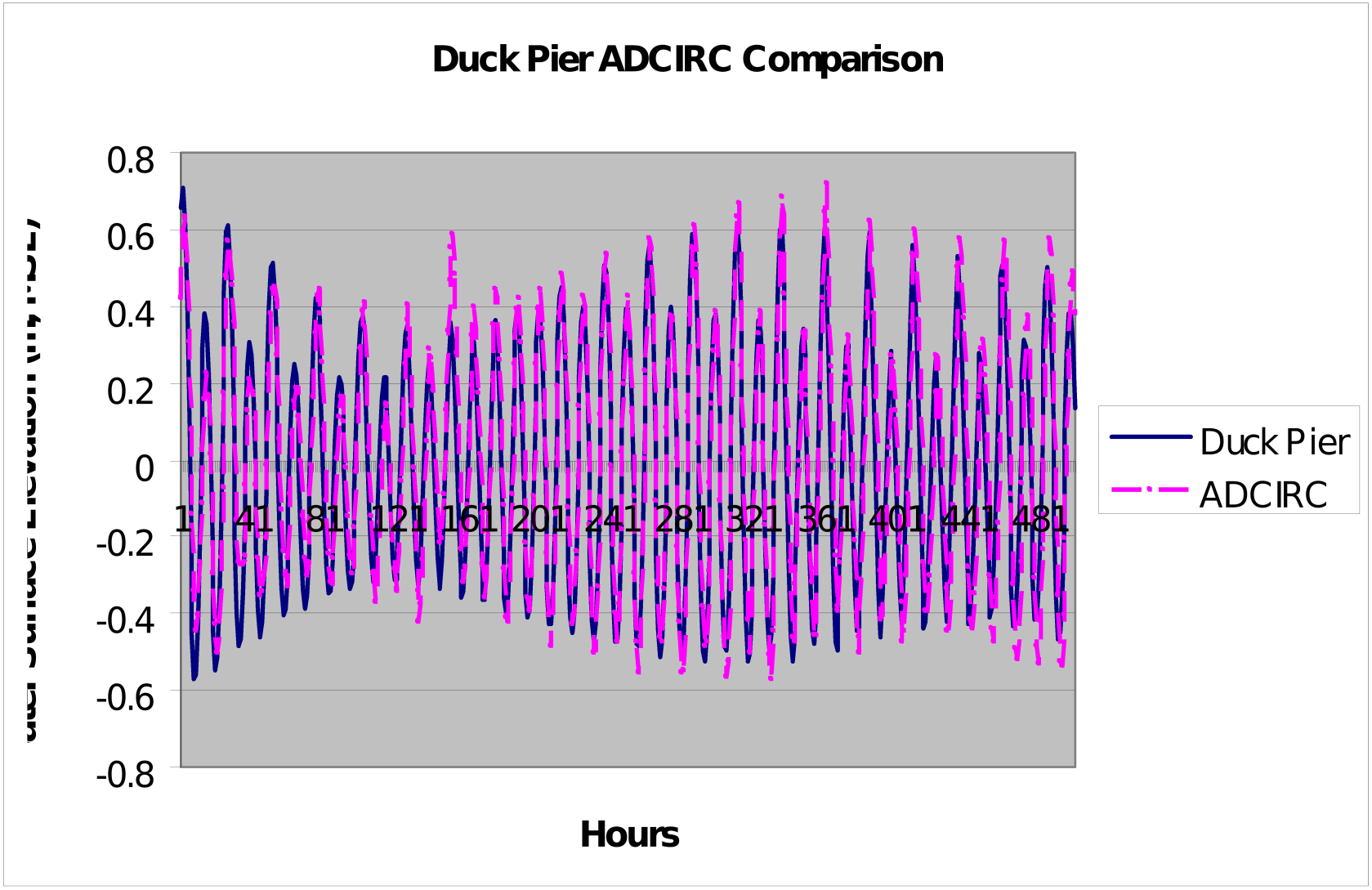


April 2006 Initial Model Calibration Period

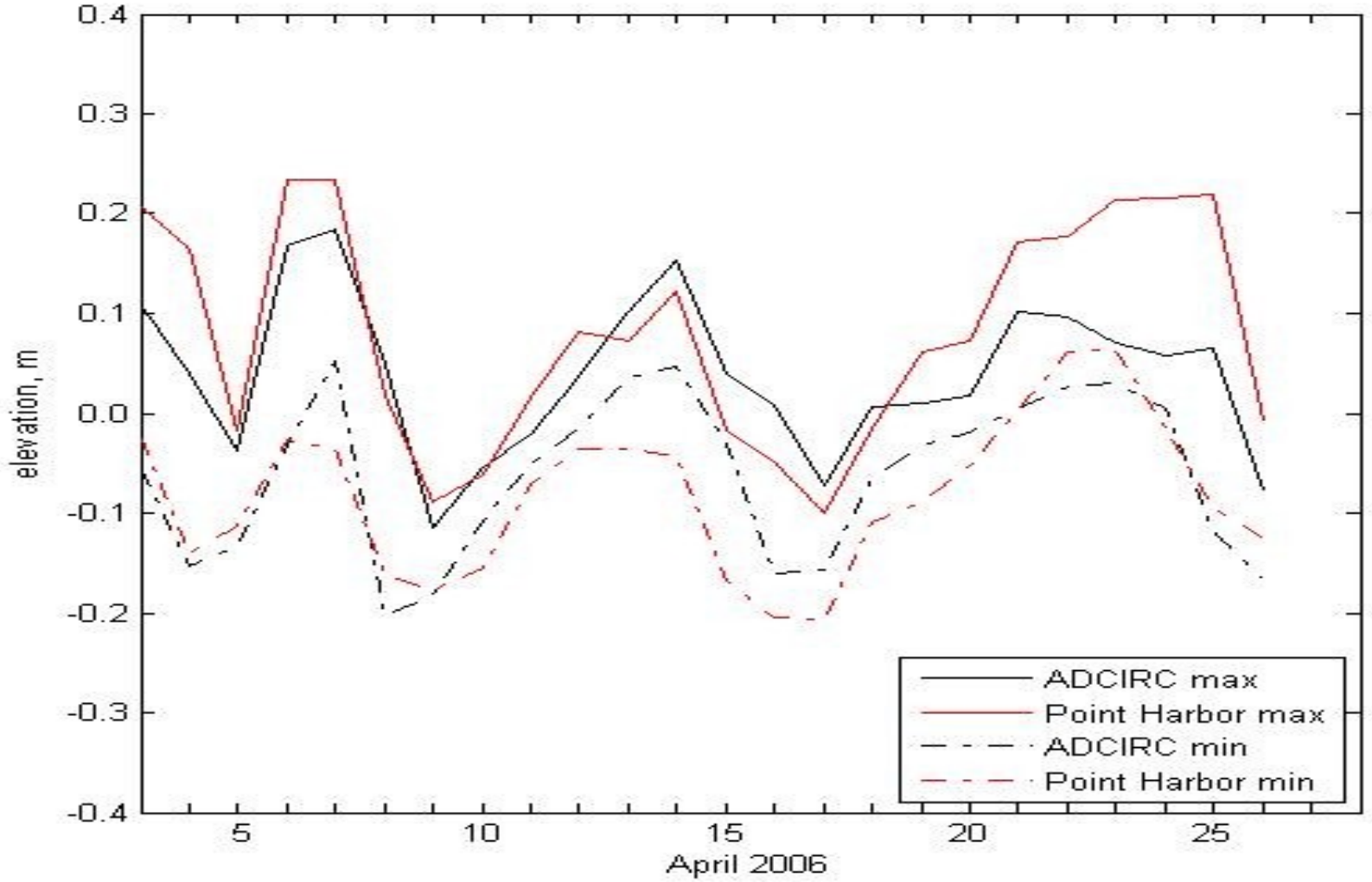



surface elevation
0.370
0.310
0.250
0.190
0.130
0.070
0.010
-0.050
-0.110
-0.170
-0.230

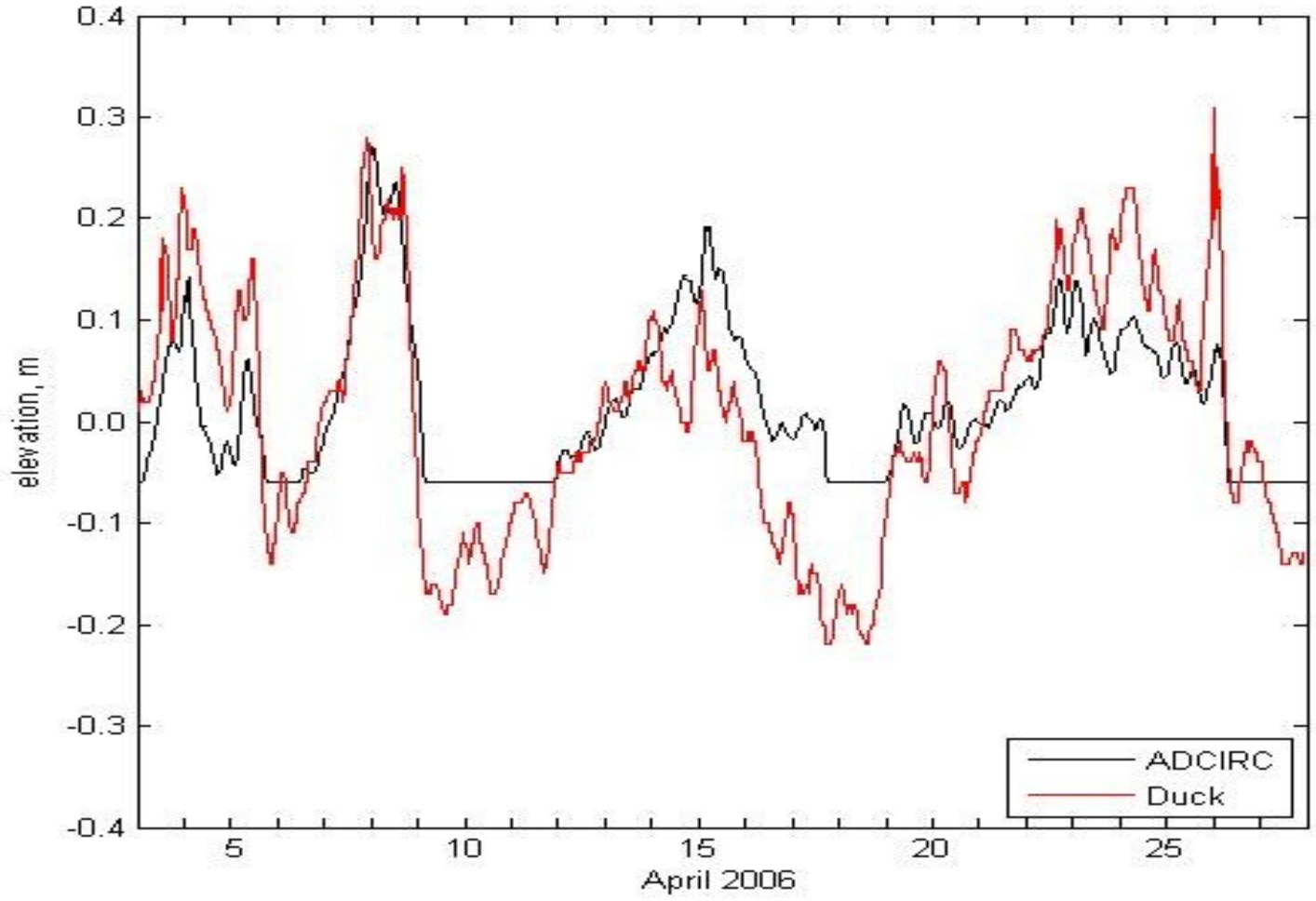

velocity - layer 1_mag
0.850
0.766
0.682
0.598
0.514
0.430
0.346
0.262
0.178
0.094
0.010


Duck Pier ADCIRC Comparison
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
1
41
81
121
161
201
241
281
321
361
401
441
481
Hours
Duck Pier
ADCIRC

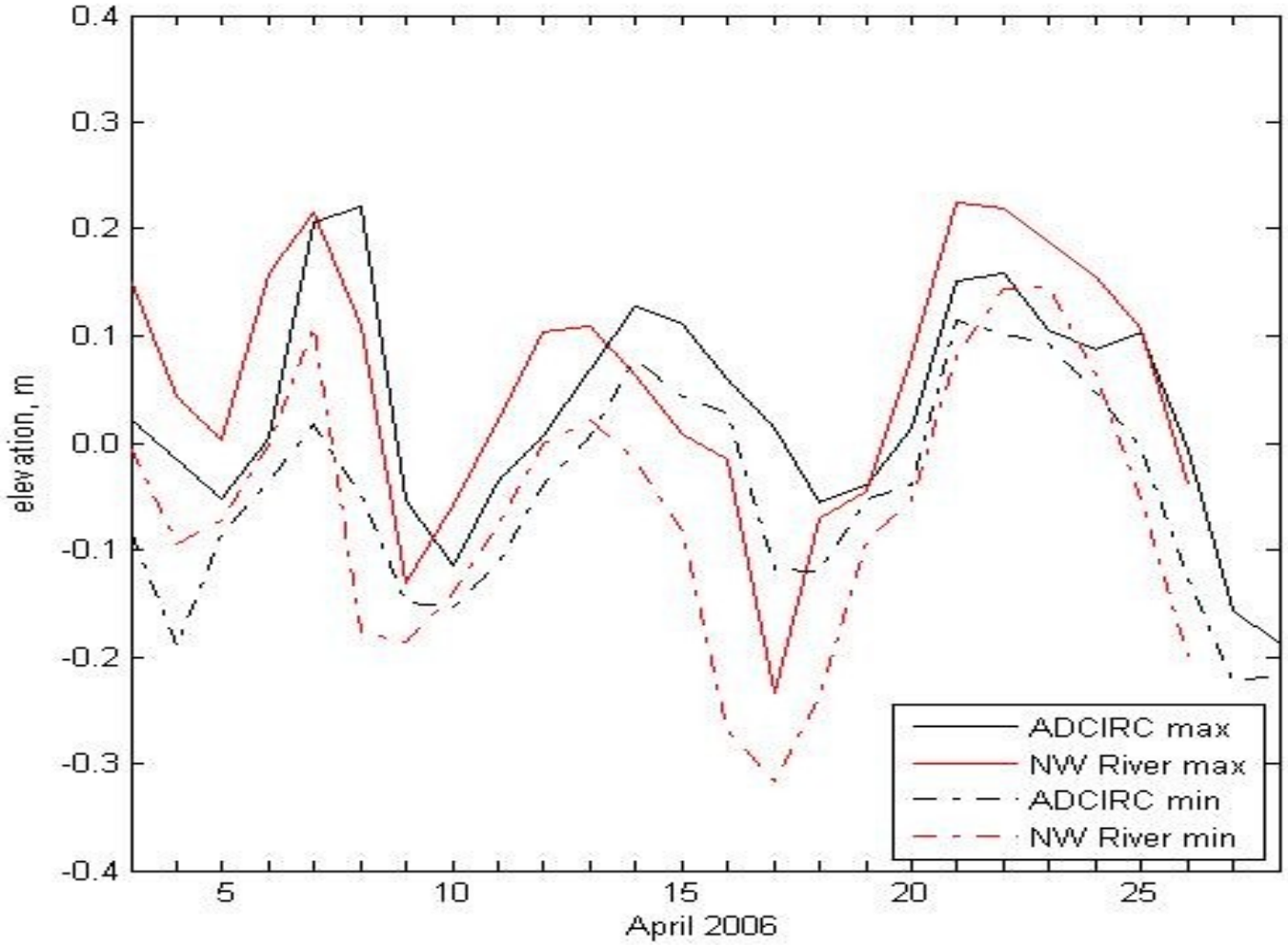
ADCIRC PT Harbor Comparison

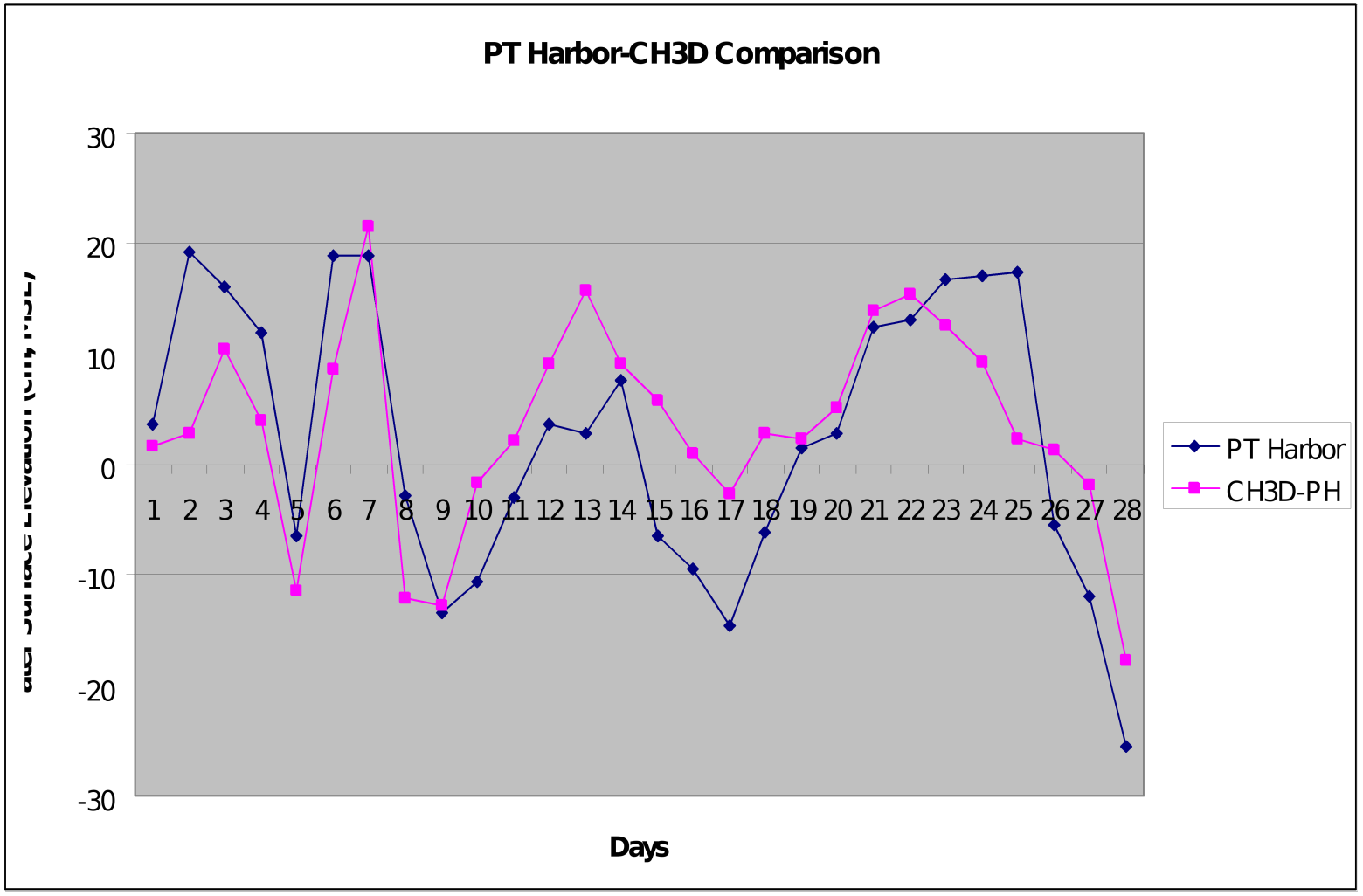


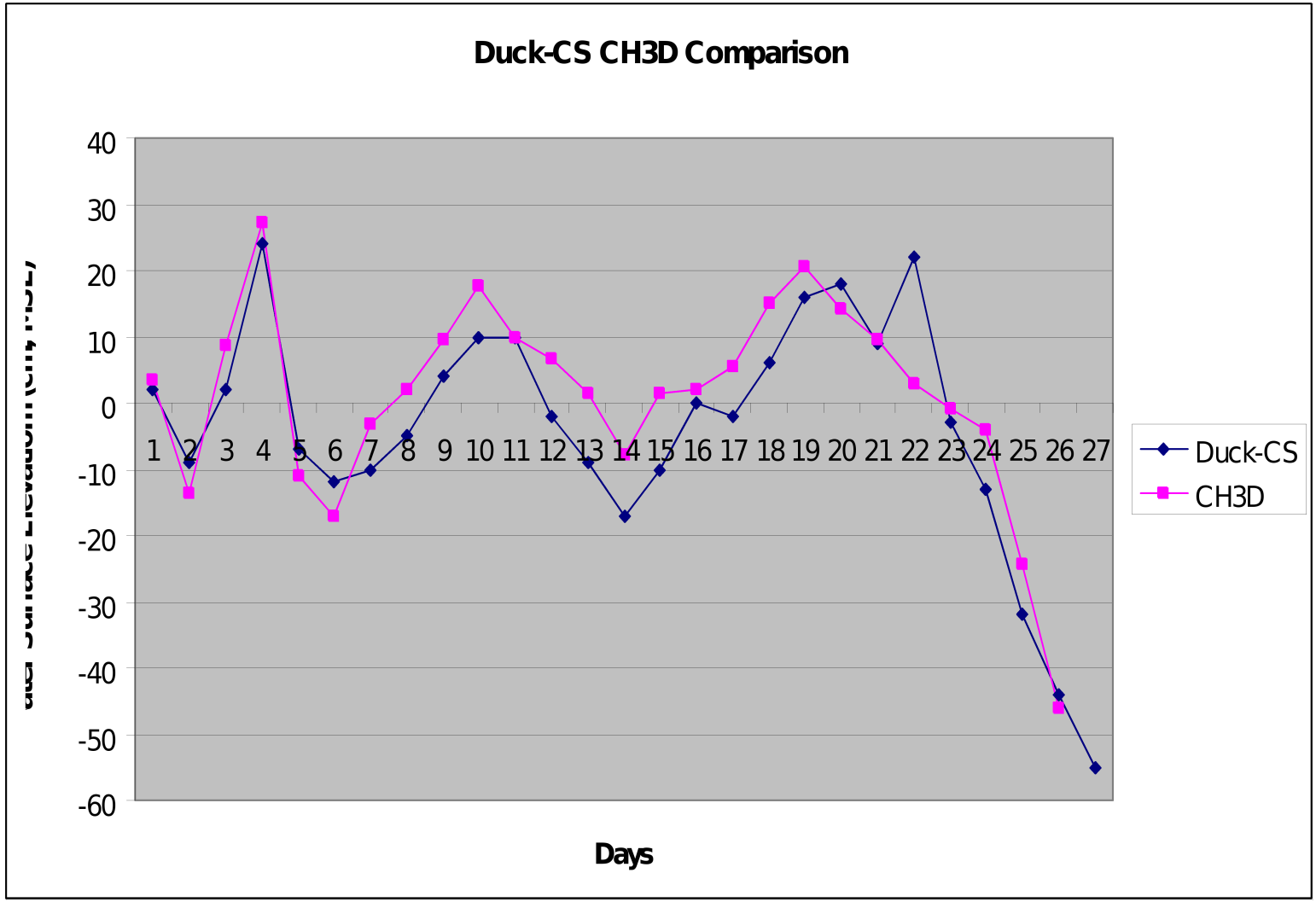
ADCIRC Duck CS Comparison

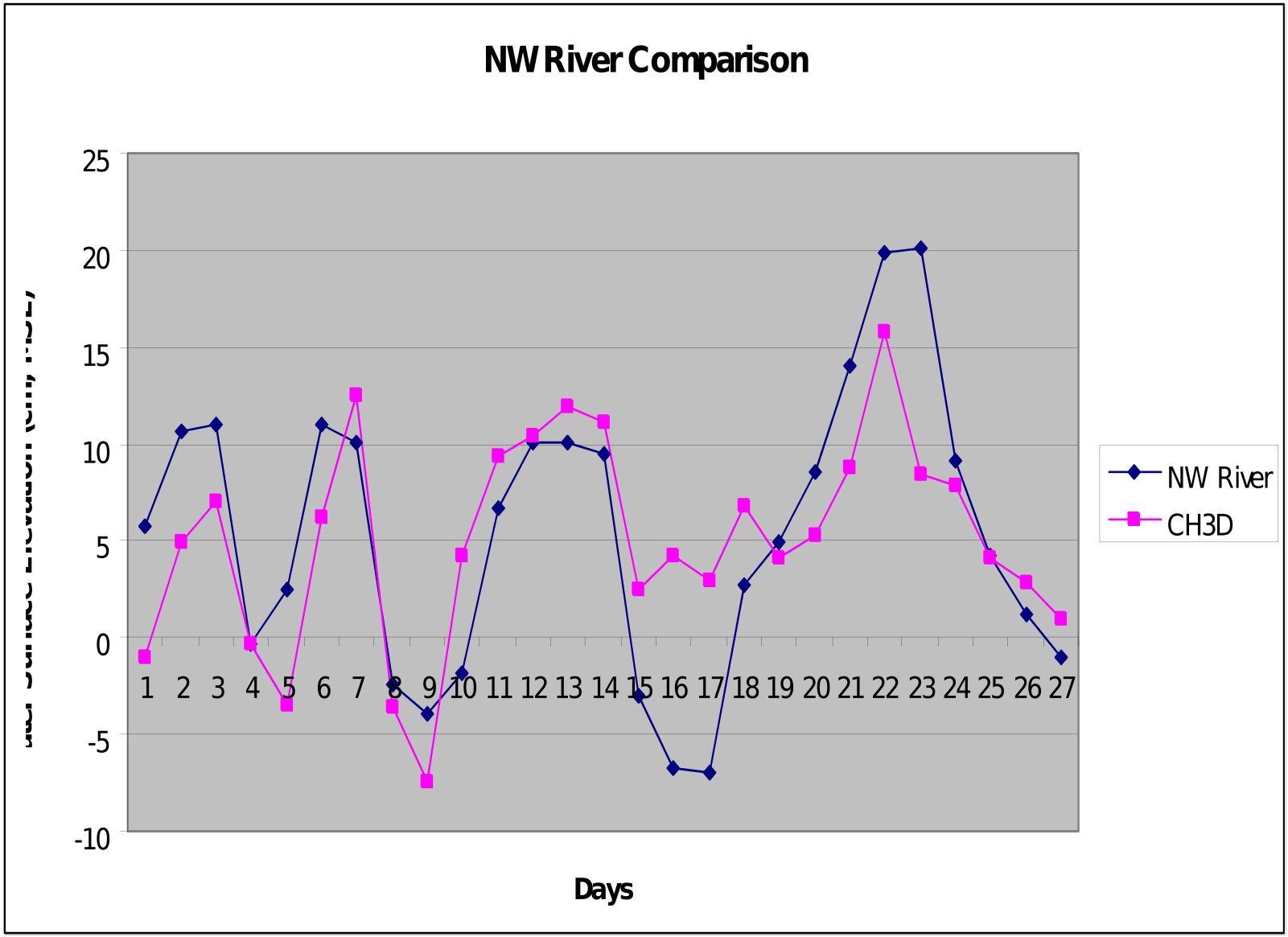


ADCIRC NW River Comparison




PT Harbor-CH3D Comparison
30
20
10
0
-10
-20
-30
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
Days
PT Harbor
CH3D-PH


Duck-CS CH3D Comparison
40
30
20
10
0
-10
-20
-30
-40
-50
-60
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Days
Duck-CS
CH3D


NW River Comparison
25
20
15
10
5
0
-5
-10
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Days
NW River
CH3D

Model Simulations and Mitigation Scenarios

- Barry, Take a crack at this.

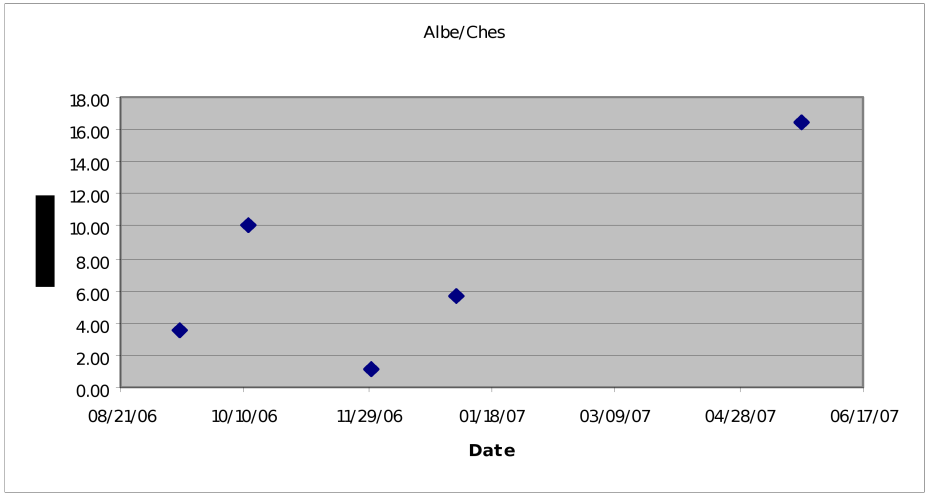
Water Quality Calibration

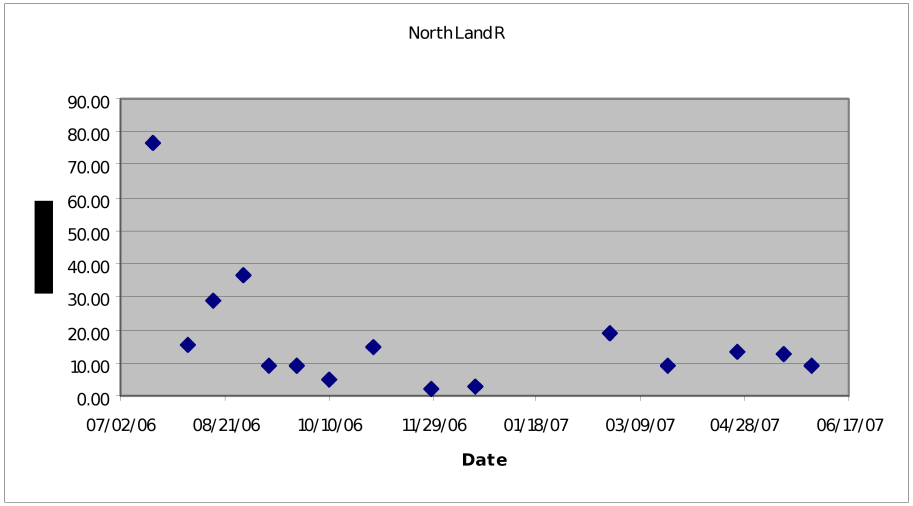
- Corresponds to sampling period July 2006 through June 2007
- Water quality data obtained Aug 1, 2007
- Plotting results for discrete sampling

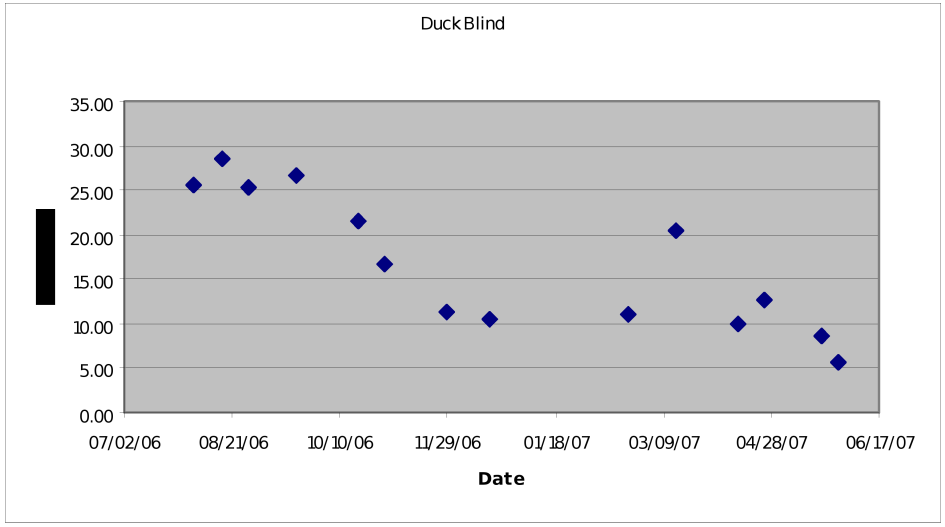
Example slide of data

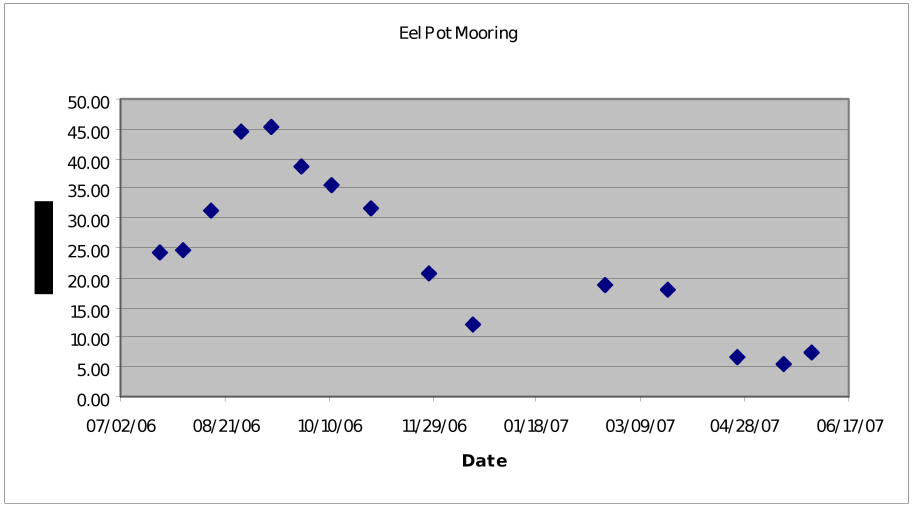
- See next slide. I can put several of these in to give a feel for the data.

Selected Chlorophyll









Mitigation Scenarios

- Identification of sites for remediation based upon water quality and hydrodynamic characteristics
- Impact of watershed changes on water quality in Sound. What will impacts be at sites identified for restoration?

What else do we want to put?